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A Proposed Study of Outcomes for Autistic Children and Their Families After Participation in a Horse Boy Camp

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A Proposed Study of Outcomes for Autistic Children and Their Families after Participation in a Horse Boy Camp

by

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A Proposed Study of Outcomes for Autistic Children and Their Families After Participation in a Horse Boy Camp

by

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The aim of this proposed study is to explore whether participation in a three day intervention involving horseback riding in nature– a program specifically designed for autistic children and their families called "Horse Boy Camps" – leads to improved outcomes for participants. It is hypothesized that children will demonstrate significant increases in language and communication skills after camp participation, as well as enhanced social, cognitive and sensory functioning. It is also hypothesized that attendance at a Horse Boy Camp will have an impact on the parents and siblings of the child with autism. Specifically, it is anticipated that camp participation will significantly decrease the anxiety, stress, depression and social isolation experienced by parents. It will also result in significant improvements in the relationship between the autistic and their siblings as well as family functioning in general. Participants will include 20 families attending a three-day Horse Boy Camp. There will be one autistic child per family who attends the camp, and at least one parent. The proposed study will help determine if Horse Boy Camps appear to be a promising intervention for children with autism and their families.

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Chapter One: Introduction

Autism is an epidemic in Western society. Although exact prevalence rates are unknown, the Center for Disease control estimates that 1 in 110 children in the United States (Rice, 2011) and 1 in 100 children in the United Kingdom (Baron-Cohen et al., 2009) are now classified as having an Autism Spectrum Disorder (ASD). Autism is a developmental disability characterized by social impairments, communication difficulties, and restricted, repetitive, and stereotyped patterns of behaviors (American Psychiatric Association, 2000) with similar numbers being reported in Asia, Europe and Canada (Rice, 2011). For instance, a recent study reported a 2.6% prevalence rate of autism in South Korea (Kim et al., 2011).

Autism can be a highly disabling condition, impacting children's ability to interact and function in a complex social world. Children with autism are also frequently observed to experience difficulties with sensory processing, and a recent study found support for the universality of these features across the spectrum (Ben-Sasson et al., 2009). Lane et al. (2010) identified three distinct sensory processing subtypes in autism that are associated with taste smell and movement. Further the researchers found that sensory processing subtypes were a unique predictor of communication competence and maladaptive behaviors.

The DSM -IV-TR (American Psychiatric Association, 2000) views autism as a spectrum of disorders with distinct subcategories. It includes ASDs under a wider category of Pervasive Developmental Disorders (PDDs). Within ASDs, there are subtypes of Autistic Disorder, Asperger's Disorder, and Pervasive Developmental

Disorder – Not Otherwise Specified (PDD-NOS). A diagnosis of Asperger's Disorder requires normal development of language, cognitive skills, and adaptive behavior whereas a diagnosis of Autistic Disorder requires delays in language, social interaction, or symbolic play prior to three years of age. A diagnosis of PDD-NOS is appropriate when an individual exhibits a marked impairment in reciprocal social interaction but does not meet full symptom criteria for Autistic Disorder or Asperger's Disorder.

The increased prevalence of ASD can be accounted for in part by changes in diagnostic criteria that allow for the inclusion of a wider spectrum of autistic behavior, in addition to an increased public awareness of the disorder (Fombonne, 2005; Wing & Potter, 2002). There is convincing evidence that autism is a genetic disorder (Bonora et al., 2006). However, the rising prevalence has also raised concerns about possible environmental causes. More research is needed to understand if environmental variables may trigger ASD. Currently, evidence for environmental factors is inconclusive (Miller & Reynolds, 2009). Research suggests that there may be an interaction between environmental and genetic factors (Folstein & Rosen-Sheidley, 2001; Moy & Nadler, 2008). For instance, it is possible that individuals who have a genetic susceptibility to ASD are more sensitive to prenatal or postnatal environmental agents, which serve as triggers to the expression of ASD.

While the causes of autism remain largely unknown, there are an increasing number of treatments available to help autistic children function more effectively. In addition to traditional therapies such as Applied Behavioral Analysis (Lovaas, 1987), which tend to rely on extrinsic motivation to shape autistic children's behavior in

specified ways, increasing attention is also being focused on interventions that foster a child's curiosity, interest and intrinsic motivation through reciprocal social interactions. These types of relationship-focused interventions encourage and support parents to enhance their use of responsive interactive strategies with their ASD children, and research suggests that this approach can significantly improve children's social and emotional functioning (Mahoney & Perales, 2003).

One promising intervention approach that may enhance intrinsic motivation and reciprocal social interactions among autistic children is animal assisted therapy (Fine, 2006). Animal assisted therapy uses the human-animal bond as an integral part of the treatment process (Bizub, Joy, & Davidson, 2003). A subtype of this therapeutic approach is equine assisted therapy (EAT), a collective term for all types of activities using horses as a tool in a therapeutic process. EAT typically involves teaching riding skills or else using the horse as a medium to teach balance, communication and social skills. A study by Thomas et al. (2007) found that 11% of parents with an autistic child reported using an EAT as a social therapy intervention. EAT has been found to be an effective intervention for children with different disabilities, including cerebral palsy (Sterba, Rogers, France, & Vokes, 2002;), sensory integration difficulties (Candler, 2003) and developmental delay (Winchester, Kendall, Peters, Sears, & Winklsy, 2002). There is also some evidence that EAT is effective in enhancing sensory motor, communication, and overall social interaction skills in autistic children (Umbarger, 2007; Garrique, Moutiez, & Galland, 1994; Citterio, 1997; Leitao, 2004).

A controlled study of EAT for autistic children conducted by Bass, Duchowny, and Llabre (2009) evaluated the effects of EAT on social functioning in children with autism following a 12-weeks horseback riding intervention. Autistic children who took part in the therapeutic riding program exhibited significantly greater sensory seeking, sensory sensitivity and social motivation compared to a wait-list control group, as well as less inattention, distractibility, and sedentary behaviors. The results of this study suggest that EAT improves the functioning of autistic children, and that parents of autistic children should consider equine therapy as an effective treatment option.

The EAT examined in the Bass et al. (2009) study was a traditional program conforming to NARHA (North American Riding for the Handicapped Association) guidelines. This approach typically involves an instructor and trained volunteers who walk alongside the child as he or she sits alone on the horse, teaching skills like mounting and dismounting, reining, or walk/trot. Games such as Simon Says or saying letters of the alphabet while the child sits on a stationary horse are also included to help autistic children gain communication skills. Horsemanship activities such as grooming are taught as well. Parents and other family members are usually not actively involved in the child's riding session.

One limitation of traditional equine therapies is that they were not specifically designed with autism in mind. Rather, they were largely developed in order to teach riding skills to children with physical disabilities such as cerebral palsy. While some autistic children may eventually learn to ride, the main focus of horse therapy for autistic children is on developing cognitive, verbal and social skills rather than horse-riding skills

per se, and for that reason a program designed specifically to address the developmental needs of autistic children may be even more beneficial. Also, because traditional therapeutic riding programs do not involve the entire family, a crucial opportunity is missed to address the psychological difficulties experienced by the parents and siblings of autistic children.

The extreme care-giving challenges faced by parents of ASD children means that they experience greater stress and depression than parents of typically-developing children (Baker-Ericzen, Brookman-Frazee & Stahmer, 2005; Ingersoll & Hambrick, 2011), especially among those who have difficulty accepting and coming to terms with their child's autism diagnosis (Milshtein, Yirmiya, Oppenheim, Koren-Darie, & Levi, 2010). Smith and colleagues (2009) found that mothers of an ASD child spent more time caring for their children, spent fewer hours engaged in leisure activities, and experienced more stress and arguments at home than did mothers of typically developing children. The normally developing siblings of ASD children also tend to experience psychological problems such as stress and depression (Gold, 1993). Siblings may feel anger and frustration at the extra chores and responsibilities they have to take on (Kaminsky & Dewey, 2002). In fact, eighty percent of siblings of autistic children have little or no involvement in childhood activities such as youth groups, hobbies and recreational classes due to their parents' focus on treating their sibling's disorder (Barak-Levey, Goldstein & Weinstock, 2010).

Research has also shown that high levels of parental stress and anxiety as well as intense feelings of isolation and loneliness will not only cause intense psychological

distress to the parents of children with ASD but will also negatively impact the child themselves. Siefer et al, 1992 found that family stress can be a contributing factor to an unfavorable prognosis. Further to this research findings go so far as to show that pre-intervention parental stress levels are the single most important predictor of the success of early intervention programs designed for children with ASD and that high levels of maternal stress has an inverse relationship with the educational progress of the child with autism (Robbins et al, 1991). It is therefore essential for parents of children with ASD to be given targeted interventions that help them reduce and cope with the high levels of anxiety, depression, stress and social isolation that they feel in order to not only improve their own psychological well-being but also the psychological well-being of their children.

Fortunately, EATs can provide fun and leisure for the parents and siblings of autistic children, while also reducing their stress and enhancing their psychological well-being. Studies on equine-assisted psychotherapy indicate that contact with horses is an effective means of healing depression, stress and trauma among non-disabled populations (Ewing, MacDonald, Taylor, & Bowers, 2007; Klontz, Bivens, Leinart, & Klontz, 2007; Masini, 2010; Schultz, Remick-Barlow, & Robbins, 2007; Yorke, Adams, & Coady, 2008). Thus, involving non-autistic parents and siblings in EAT should provide an opportunity to enhance family well-being in addition to helping autistic children themselves.

Chapter Two: Horse Boy Method of Equine Therapy

There is a new method of equine therapy that has been designed intentionally with the needs of autistic children and their families in mind. Rupert Isaacson developed an approach called the Horse Boy Method (www.horseboyworld.com) after finding that horses immensely improved the functioning of his son Rowan, who is autistic. The Horse Boy Method is used by instructors in riding school settings and is also applied in three-day Horse Boy camps in which several families with autistic children camp in nature, and everyone including parents and siblings have the opportunity to ride and participate in group activities (e.g., sitting around the camp fire, taking nature walks, playing group games.) In order to understand why Horse Boy camps may be an innovative and effective way of helping autistic children and their families, it is first necessary to examine the unique features of the Horse Boy Method.

Unlike most therapeutic riding interventions the entire family is encouraged to come for the therapy session and to spend several hours at the riding location. Parents interact with both the child and EAT provider, providing a sense of security for the child and also providing invaluable information about the child's interests that the therapist can capitalize on. Siblings are also encouraged to play and ride, so that they have a fun day out with their autistic brother or sister. An emphasis is also placed on providing a stimulating environment for autistic children – environments that are designed to enhance motivation, physical activity, and intrinsic interest. For example, there might be small animals, swings, trampolines, and other fun activities for the children and their siblings, which often helps them relax with their family before getting on a horse.

Therapists also do as much riding as possible on nature trails rather than being confined to a riding arena. Previous studies have identified several features within a school classroom that have been observed to impair the sensory functioning of children. These include bright artificial colors and light, pattern glare and echoing (Shabha, 2006), all of which are less likely to be a problem out on the trail than in a riding arena or classroom.

.Additionally, the Horse Boy Method places an emphasis on using the horse as a vehicle to explore the exterior world. Practitioners are trained to talk as much as possible about the things that they observe and come across on the trail in order to help the child delight in and order the world around them. Therapists trained in the Horse Boy method are also highly focused on using the riding experience to promote communication and completion of tasks. For instance, the therapist might ask questions like "where do you want to go?" "should we go fast or slow?" with the immediate reward of actually taking the action requested by the child.

In order to help facilitate this communication, therapists trained in Horse Boy method use horses for both sensory work and back riding. Sensory work involves the child lying and relaxing on the horse while it grazes. It is thought that gentle contact with the horse may help to calm the nervous system, especially since the horse tends to provide a gentle rocking motion as it grazes (Solodkin, Hlustik, Buccino, 2007). It also allows for a stronger emotional bond with the horse. Siblings and parents are also given time to lie on the horse in this relaxed way. Back-riding involves an adult rider sitting behind the autistic child in an oversized saddle, allowing for faster gaits like trot and canter which may stimulate the cerebellum (Bass et al., 2009), as well as enhancing the

enjoyment of riding and thereby increasing intrinsic motivation. The close body contact with the adult rider holding the child may also release oxytocin (Holt-Lunstad, Birmingham, & Light, 2008). An additional advantage of back riding is that children can communicate with the adult rider without looking at them directly in the face, which may reduce the anxiety experienced by many autistic children in face-to-face contact situations (Kleinhans et al., 2010). All horses used with the Horse Boy Method are also trick-trained to perform tricks such as smile or bow. These tricks can be elicited by the use of one or two-word commands, and provide a highly motivating context for autistic children to speak.

The Horse Boy Method is being increasingly adopted by therapeutic riding stables, and in fact the Riding for the Disabled Association (RDA) in the UK has officially adopted Horse Boy methods in its guidelines for its program of equine therapy for autistic children.

One of the most innovative ways in which the Horse Boy method is being employed, however, is in three day Horse Boy Camps, in which several families with autistic children ride and camp in nature (this intervention is described in more detail in the methods section).

There have been many testimonials to the effectiveness of Horse Boy camps in terms of spurring language, social, and cognitive development for autistic children, and also in terms of helping families start to take a more positive and hopeful outlook on their child's condition. Clearly, however, scientific research is needed to determine if the novel therapeutic approach has merit.

Chapter Three: Proposed Research Study

The proposed pilot study examined whether there will be a significant impact of participation in a Horse Boy Camp for autistic children and their families following completion of the camp.

Hypotheses

Hypothesis 1. In line with previous research it is hypothesized that attending a three-day Horse Boy Camp will have a significant impact on the functioning of the child with autism in terms of their language and communication as well as their social and sensory functioning.

Rationale. Children with autism are frequently observed to experience difficulties with sensory processing. For this reason, Lane et al. (2010) suggest that the use of sensory-based interventions should be continued in the remediation of communication and behavioral difficulties in autism. As previously mentioned Horse Boy Method emphasizes the use of back-riding and sensory work when working with children with autism. Practitioners are trained to talk as much as possible about the things that they observe and come across on the trail in order to help the child learn communication skills. Working with social animals such as horses has also been shown to have a positive effect on the social functioning of children with autism (Bass et al, 2009).

This suggests that participation in a Horse Boy Camp will enhance autistic children's language and communication as well as their social and sensory functioning.

Hypothesis 2. It was also hypothesized that attending a three day Horse Boy Camp would have a significant impact on the psychological well-being of the parents of the child with autism.

Rationale. Previous EAT studies have shown that contact with horses is an effective way of healing depression, stress and anxiety in non-disabled populations (Ewing, MacDonald, Taylor, & Bowers, 2007: Klontz, Bivens, Leinart, & Klontz, 2007; Masini, 2010; Schultz, Remick-Barlow, & Robbins, 2007; Yorke, Adams, & Coady, 2008). It was therefore anticipated that attending the camp would significantly decrease the anxiety, stress and depression of the parents who attend the camp. Additionally the emphasis placed on social support and community at the camps is also likely to have a positive impact on parental anxiety, stress and depression. Studies show that social support is a protective factor for the adaptation of parents of children with autism and informal support (from friends but also other parents of children with disabilities) has been found to be the most critical (Lounds, 2004). Parenting a child with autism has also been found to lead to feelings of social isolation and a lack of connectedness with the outside world (Higgins, Bailey & Pearce, 2005). This is thought to be, in part, due to the stigmatization that these parents often feel in public situations (Gray, 1993). The focus within Horse Boy Method on providing a social setting where three to four families can meet and spend time together in a judgment free environment is therefore anticipated to have a positive impact on the feelings of social connectedness experienced by parents who attend the camp.

Hypothesis 3. It was hypothesized that there would be significant improvements in family functioning. This includes the relationship between the child with autism and their siblings, the impact of the autistic child on the marriage, as well as impact on family functioning in general.

Rationale. As well as impacting the parents directly having a child with autism in the family has also been found to have a negative impact on the family functioning in general. Parenting a son or daughter with ASD poses a number of unique challenges, any of which may take their toll on a marriage. While the extent of this toll is yet to be agreed on it is generally assumed that divorce rates are higher amongst parents of special needs children than the population in general (Hartley et al, 2010). It has been suggested that this is due to the lack of attention devoted to one's spouse due to the extreme care-giving needs of a child with autism (Shapiro et al., 2000). The siblings of children with autism have also been found to suffer with one study reporting that eighty percent of siblings of children with autism have little to no involvement in childhood activities (Barak-Levey, Goldstein & Weinstock, 2012) which can lead to feelings of anger and frustration and damage the relationship between the child with autism and their siblings (Kaminsky & Dewey, 2002).

A key focus of the Horse Boy Camps is on helping family functioning as a whole. All family members take part in various activities that create bonding experiences that bring the family closer together. For instance, parents are always present when the child is interacting with the EAT provider which helps to orient the child to his or her interests. Additionally throughout the camp an emphasis is placed on facilitating time and space for

couples to spend time together safe in the knowledge that their child is being well-cared for. An example of this would be creating an opportunity for a couple to take a walk alone together while their children are participating in other activities with staff members and volunteers. Siblings are also encouraged to play and ride at the camp, so that rather than creating friction between sibling's therapeutic treatment and their own pleasurable activities, the two can be combined into a family activity that is enjoyable for everyone.

Methods

Participants

Participants will be 25 families invited to take part in the research study. All families will have one autistic child and at least one parent in attendance at a three day Horse Boy Camp. The camps will be advertised on the Internet and by contacting local and national autism groups. Individuals who sign up for the research study will be given a reduced fee to attend a camp. Participants will be informed that their participation in the study is voluntary, and they can discontinue the study at anytime for any reason. Participants will receive and sign a consent form and will have the chance to discuss concerns with a Horse Boy Camp staff member.

Approval by Human Subjects Committee

The study will comply with the ethical standards set forth by the American Psychological Association. Approval by the Institutional Review Board at the University of Texas at Austin and the Educational Psychology Departmental Review Committee will be obtained.

Measures

One of the parents attending the camp will be asked to complete an on-line survey one week before and one month after attending a Horse Boy Camp. A variety of measures will be used to assess the impact of camp attendance for autistic children and their parents and siblings.

Autism Symptoms. Participants will be given the Autism Treatment Evaluation Checklist (ATEC) (Autism Research Institute 2, 1999) which is a 77 item questionnaire specifically developed to measure treatment effects in individuals with ASDs. The questionnaire consists of 4 subscales: speech/language/communication (e.g. 'Knows own name') (14 items); sociability (e.g. 'Ignores other people') (20 items); sensory/cognitive awareness (e.g. 'Responds to own name') (18 items) and health/physical behavior (e.g. 'Bed-wetting') (25 items). Reponses are given on a scale from 1 (not descriptive) to 3 (very descriptive) for the first three subscales and from 1 (not a problem) to 4 (serious problem) for the health/physical behavior subscale. Based on these responses scores are computed for each domain. A recent study found that the ATEC has high internal consistency and is correlated with standardized measures of cognitive, language, and adaptive behavior skills and severity of autism symptoms (Magiata, Moss, Yates, Charman & Howlin, 2011).

Sensory Processing. Participants will be given the Sensory Profile - Short (Dunn, 1999) which is typically administered to parents or teachers. The measure addresses the degree to which children exhibit problems in terms of sensory processing, modulation, and behavioral and emotional responses to sensory stimulation. For the purposes of this

study, the subscales will be used that assess Tactile Sensitivity (e.g. 'expresses distress during grooming'), Movement Sensitivity (e.g. 'becomes anxious or distressed when feet leave the ground') and Underresponsive/Seeks Sensation (e.g. 'becomes overly excitable during a movement') (a total of 17 items). Responses are given on a scale from 1 (almost always) to 5 (nearly never) and based on these responses a score is computed for each domain. Internal consistency of the sections within the scale range from .70 to .90 (Dunn, 1999).

Depression, Anxiety, and Stress. Participants will be given the DASS-21 (Lovibond & Lovibond, 1995), a commonly used 21-item scale measures adults' levels of depression (e.g. 'I couldn't seem to experience any positive feeling at all'), anxiety (e.g. 'I was aware of dryness of my mouth') and stress (e.g. 'I found it hard to wind down'). Responses are given on a scale from 0 (does not apply to me at all) to 3 (applies to me very much). Participants are given a separate score for depression, stress and anxiety with higher scores indicating higher levels. The three scales comprising the DASS have been shown to have excellent internal consistency both for the 42 and 21 item version of the scale (Brown et al, 1997).

Social Connectedness. Participants will be given the Social Connectedness Scale (Lee & Robbins, 1995), which measures the degree of interpersonal closeness that individuals feel between themselves and other people, both friends and society (e.g. ' I feel disconnected from the world around me') Responses are given on a scale from 1 (strongly agree) to 5 (strongly disagree) with higher scores representing a stronger sense

of belonging. Internal consistency reliabilities for the Social Connectedness Scale are generally around $\alpha = .91$.

Family Impact. Participants will be given the Family Impact Questionnaire (Donenberg & Baker, 1993), which assesses the impact of parent's perceptions of their child's impact on their family compared to 'most children his/her age.' For the purpose of this study the subscales that assess; feelings and attitudes towards child (e.g. 'I feel like I could be a better parent with my child'); impact on marriage (e.g. 'My spouse and I disagree more about how to raise this child'); impact on siblings (e.g. 'My child prevents his/her siblings from participating in activities more'); and general impact (e.g. 'Compared with other children my child's age, the impact of my child on our family is?') will be assessed (33 items total). Responses are given on a scale from 0 (not at all) to 3 (not very much) and based on these responses a score is computer for each subscale as well as a total score. Internal consistencies of the subscales range from .83 to .92 (Donenberg & Baker, 1993).

Consent

Participation in the study is voluntary, and participants can discontinue the study at anytime for any reason. Participants will receive a copy of the consent form and will have the chance to discuss concerns with a research staff member.

Intervention

The intervention will involve participation in a Horse Boy Camp, a three day/ two night immersion into the Horse Boy method. During a camp up to four families camp together in cabins, bunk houses or tents with a team of trained Horse Boy staff,

volunteers and horses. Each camp is led by a trained camp leader who has completed a basic Horse Boy Method training course as well as a Horse Boy Camp training course and participated in at least three prior Horse Boy Camps.

A regular camp day is variable and tailored to the needs of individual families, however, but there are a number of essential components that must be present. For a location to be classified as suitable for a Horse Boy Camp it therefore must have access to nature trails for riding and hiking, be closed to the general public, have outside play equipment such as a trampoline and swings and have a secure place to keep the horses. The therapy must be presented in the context of a fun family adventure in nature, involving camping, sitting around a camp fire, nature walks, and intensive horseback riding for all interested family members. For this reason each camp must involve several autism families so that they can gain a sense of community and share mutual experiences in a safe and supportive environment.

Each camp includes at least one highly skilled adult rider who can sit behind the child in an oversized saddle to accommodate faster gaits like trot and canter, possibly providing stimulation of the cerebellum and providing a fun and relaxed context for communication that does not provoke face-to-face anxiety. Riders are approved by Horse Boy Staff members as being trained to a suitably high standard to stimulate language development by using verbal commands to elicit highly motivating actions from the horse such as trot, smile or bow. Sensory therapy, which involves allowing all family members to relax on the horse while it grazes, helping to calm the nervous system, is also provided.

Data Analysis

Each participant will be assigned a number, and data associated with each participant will be de-identified to protect against research bias. SPSS statistical software will be used to analyze data. Descriptive statistics, including means, standard deviations, ranges, and minimum and maximum values, will be analyzed for each variable. Variables will also be checked for normality. Data will also be checked for outliers. Linearity will be determined based on scatterplots. Normal distribution of residuals will be confirmed using a residual and predicted value plot. Data will also be tested for multicollinearity. Additionally, the assumptions for the t-test will be examined. Specifically, normality will be checked using a histogram. Equality of variance will be examined using Levene's Test.

To examine changes after the camp, pre and post scores on all variables will be analyzed using paired-samples t-tests. This statistical test is mainly used when data is collected at two separate times from a single sample of participants which makes it useful at assessing change over time. Assuming normality of data it will therefore be the most appropriate way of measuring the child and family outcomes of attending a three day Horse Boy Camp. When conducting a paired samples t-test, SPSS automatically checks the assumption of equal variances using Levene's test and provides statistics for both the Student's t-test, which assumes equal variances, and the Welch's t-test, which does not assume equal variances. In both Student's t-test and Welch's t-test, a t score associated with an alpha of less than .05 will be considered significant.

Expected Results

Participation in a three day Horse Boy camp is expected to yield significant results. First, it is expected that children will demonstrate significant increases in wellbeing, specifically in terms of language and communication skills after camp participation, as well as enhanced social, cognitive and sensory functioning. It is also expected that attendance at a Horse Boy Camp will have an impact on the parents and siblings of the child with autism. Specifically, it is anticipated that camp participation will significantly decrease the anxiety, stress, depression and social isolation experienced by parents. It is also anticipated that attending the camp as a family will result in significant improvements in the relationship between the autistic and their siblings as well as family functioning in general.

Chapter Four: Discussion

Autism is an extremely complex neuropsychological disorder which is characterized by social impairments, communication difficulties, and restricted, repetitive and stereotyped patterns of behaviors. It can be a highly problematic condition, impacting children's ability to interact with others, make friends, and understand the social world around them. Autism is prevalent in both Western and non-Western societies, which means it is critical to find effective interventions that ameliorate the symptoms of autism.

While the causes of autism remain largely unknown, there are an increasing number of treatments available to help children with autism function more effectively. While traditional therapies, such as Applied Behavioral Analysis (Lovaas, 1987) tend to rely on extrinsic motivation to shape the behavior of children with autism, in recent years an increasing amount of attention has been focused on interventions that foster a child's curiosity, interest and intrinsic motivation through reciprocal social interactions. Research to date indicates that this approach can significantly improve children's social and emotional functioning (Mahoney & Perales, 2003). Researchers and clinicians have also begun to pay increasing attention to therapeutic interventions which address the needs of the family as a whole (Schutermann, 2007).

As previously mentioned research indicates that parenting a child with autism leads to greater stress, anxiety and depression than parenting a child who is typically developing (Baker-Ericzen, Brookman-Frazee & Stahmer, 2005; Higgins, Bailey & Pearce, 2005). In fact some evidence suggests that 70% of mothers and 40% of fathers of children with ASD experience high levels of stress, anxiety and distress (Sloper &

Turner, 1993) even to the level of clinical pathology (Dumas et al, 1991). The isolation, loneliness and lack of connectedness with the outside world experienced by parents of children with autism creates internal psychological distress, as well as impacting the quality of martial relationships and family functioning in general (Higgins, Bailey & Pearce, 2005).

Similarly, being the sibling of a child with autism has been found to have negative consequences. For instance, one study reported that eighty percent of siblings of children with autism have little to no involvement in childhood activities (Barak-Levey, Goldstein & Weinstock, 2012) which can lead to feelings of anger and frustration and damage the relationship between the child with autism and their siblings (Kaminsky & Dewey, 2002). One study showed that 40% of siblings were reported by their mothers to experience severe adjustment problems (Meyer, Ingersoll & Hambrick, 2011) and another showed that there has been an increase in the diagnoses of major depressive disorders in the siblings of children with autism (Ross & Cuskelly, 2006). These are important finding as studies have also indicated a non-conflicting sibling relationship is a protective factor for later maladjustment in the siblings of children with developmental disorders (Fisman et al, 1996).

Fisman and colleagues (1996) suggest that if families are not able to engage in joint activities with both the child with autism and their siblings then this will have a negative impact on family functioning in general. Thus, interventions are needed that address not only the child themselves but the family as a whole (Schuntermann, 2007).

If it is found that participation in a Horse Boy Camps leads to improved outcomes for autistic children and their families, therefore, it's potential impact on the wellbeing of autistic children and their families could be highly significant. If, as hypothesized, autistic children improve their language and communication skills, while also experiencing enhanced social, cognitive and sensory functioning, their ability to function effectively in the world will improve dramatically. Moreover, if it is found that attendance at a Horse Boy Camp significantly decrease the anxiety, stress, depression and social connectedness experienced by parents, improves the relationship between the autistic and their siblings and enhances family functioning in general, the intervention will show promise as an effective way to help ameliorate the myriad problem associated with the disorder.

Limitations and Future Research

The proposed study is limited in that in only allows for conclusions as to a correlational relationship between attending a Horse Boy Camp and child and family outcomes. This is in part due to the lack of a (waiting-list) control group and means that study results could have been due to the mere participation of families in some sort of group activity. It is important to note here, however, that studies that did include a waiting-list control group in their study reported no improvements in autistic symptoms during a waiting period of several months (Bass et al, 2009). Additionally the study is unable to control the other therapies and interventions that the child and family are enrolled in which again makes it hard to make any decision regarding causality. Finally

the results of the study will be based on self-reports of parents rather than objective observations.

Future research could address these limitations by comparing outcomes after participation in a Horse Boy camp with those of families attending some other sort of group activity. Data should also be collected via methods of direct observation, and siblings could be asked directly about their feelings about their sibling with autism. It might also be useful to have teachers fill out the child outcome measures in order to see if any of the results found generalized to the classroom.

Additionally the Horse Boy Foundation is in the process of developing a method of working with children with autism without horses called Horse Boy Learning. This is based around the same principles of Horse Boy Method, namely facilitating communication and learning through exploration of their environment, but can be taught to parents of children with autism for use in daily life. The premise is that more intensive time working with these methods will facilitate even greater changes in the child. In fact, this was shown in a study by Jenkins, Schuchard & Thompson (2012) that investigated the effects that high versus low intensity home based interventions had on children's autistic symptoms. Their results indicated that the greatest gains were found when parents administered high intensity interventions to their children. Therefore, evaluation of the impact of participation in the Horse Boy Learning program would be another fruitful avenue for future research.

Despite its limitations, this study could provide preliminary support for the use of the Horse Boy Method as an effective therapeutic intervention for children with autism

and their families. Horse Boy camps are unique because they involve methods of equine therapy specifically designed for the needs of autistic children. Moreover, the fact that the camps take place in a peaceful natural environment, offer a variety of activities, and focus on joint activities for the family as a whole could means that this potentially effective intervention is fun and enjoyable for all.

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